Office Action Summary	Application No.	Applicant(s).	
	09/830,752	FURUKAWA, HIROSHI	
	Examiner	Art Unit	
	Justin M. Philpott	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 April 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20010709,20020424*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 5-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 1 is objected to because of the following informalities, specifically, the following grammatical errors which should be corrected as follows: "of transmission" (line 12) should be changed to "of a transmission"; "channel, and" (line 13) should be changed to "channel and"; "up such frequency" (line 13) should be changed to "up the frequency"; "filter that" (line 14) should be changed to "filter such that"; "filter is inverse with that of" (line 15) should be changed to "filter are inverse to". Appropriate correction is required.

3. Claim 7 is objected to because of the following informalities: "is inverse with" (line 17) should be changed to "are inverse from". Appropriate correction is required.

4. Claim 8 is objected to because of the following informalities: the claim presently ends on page "12/1" with "delay times are different,", and it must be amended to change "," to a period, ".". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claim 2 recites the limitation "each prescribed weight" (lines 4-5) in claim 1. There is insufficient antecedent basis for this limitation in the claim. Applicant may overcome this rejection by amending claim 2 to instead recite "a prescribed weight".

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 3 and 4 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility.

Specifically, claim 3 recites both an apparatus (e.g., a mobile station, in line 1) as well as a method (e.g., methods described in lines 10-18), and it is unclear whether applicant's invention is directed towards an apparatus or a method. Claim 4 is dependent upon claim 3 and is

therefore rejected for the same reason. It is suggested that applicant amend claim 3 to recite an apparatus comprising elements which are operable for performing particular functions, in place of the presently unclear language of an apparatus comprising methods.

9. Claims 3 and 4 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific and substantial asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

11. Claim 8 is rejected under 35 U.S.C. 102(a) as being anticipated by applicant's admitted prior art (AAPA).

Regarding claim 8, AAPA teaches a mobile station receiving method on a down channel in a CDMA cellular system (specification, page 1, lines 15-26) in which a base station modulates, by using orthogonal pseudo random codes, transmission signals towards a plurality of mobile stations (specification, page 1, line 22 to page 2, line 4), transmits the modulated signals synchronously, while the mobile stations receive the modulated signals distorted by a plurality of

radio channels of which delay times are different (specification, page 2, lines 3-15) (e.g., see also, generally, specification, pages 1-4).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1, 3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of U.S. Patent No. 5,912,876 to H'mimy.

Regarding claim 1, AAPA teaches a mobile station receiving method on a down channel in a CDMA cellular system (specification, page 1, lines 15-26) in which a base station modulates, by using orthogonal pseudo random codes, transmission signals towards a plurality of mobile stations (specification, page 1, line 22 to page 2, line 4), transmits the modulated signals synchronously, while the mobile stations receive the modulated signals distorted by a plurality of radio channels of which delay times are different (specification, page 2, lines 3-15) (e.g., see also, generally, specification, pages 1-4), however, may not specifically disclose frequency characteristics of an equalization filter are inverse to an estimation result.

H'mimy also teaches a CDMA system such as in AAPA, and further, specifically teaches the system is characterized in that a mobile station comprises an equalization filter (e.g., filter 95, see FIG. 1) and a transmission estimation unit (e.g., accumulator 90), wherein the transmission estimation unit (e.g., accumulator 90) outputs an estimation result (e.g., estimated frequency

response, see col. 4, lines 18-41) of frequency characteristics of a transmission channel (e.g., channel 50) and sets up the frequency characteristics of the equalization filter (e.g., filter 95) such that the frequency characteristics of the equalization filter are inverse to the estimation result (e.g., see col. 4, lines 22-34). Additionally, the teachings of H'mimy provide improved channel estimation by simplifying operation and resulting in instantaneous results (see col. 2, lines 5-49 and col. 4, lines 35-41). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the CDMA teachings of H'mimy to the CDMA system of AAPA in order to provide improved channel estimation by simplifying operation and resulting in instantaneous results.

Regarding claims 3 and 6, AAPA in view of H'mimy teaches the mobile station discussed above regarding claim 1, and further, AAPA teaches demodulating independently each of the modulated signals (e.g., via respective independent demodulation units 107-109) which pass through a plurality of the radio channels of which delay times are different, and for combining the result (e.g., via combining unit 110). Still further, while AAPA may not specifically disclose an additional method of using a filter with frequency characteristics inverse to that of the radio channels, such a method is taught by H'mimy as discussed above regarding claim 1. That is, H'mimy teaches a mobile station comprises an equalization filter (e.g., filter 95, see FIG. 1) and a transmission estimation unit (e.g., accumulator 90), wherein the transmission estimation unit (e.g., accumulator 90) outputs an estimation result (e.g., estimated frequency response, see col. 4, lines 18-41) of frequency characteristics of a transmission channel (e.g., channel 50) and sets up the frequency characteristics of the equalization filter (e.g., filter 95) such that the frequency characteristics of the equalization filter are inverse to the estimation

result (e.g., see col. 4, lines 22-34). Further, H'mimy teaches selecting an output with higher communication quality among other possible outputs by a plurality of methods (e.g., see col. 2, lines 19-49, col. 4, line 23 – col. 5, line 12, and FIGS. 1 and 2 regarding selection with respect to two methods following ACCs 80 and 90). Additionally, the teachings of H'mimy provide improved channel estimation by simplifying operation and resulting in instantaneous results (see col. 2, lines 5-49 and col. 4, lines 35-41). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the CDMA teachings of H'mimy to the CDMA system of AAPA in order to provide improved channel estimation by simplifying operation and resulting in instantaneous results.

Regarding claims 5 and 7, AAPA in view of H'mimy teach the a communication system and a mobile station as discussed above regarding claim 1, and further, AAPA teaches a frequency conversion unit (e.g., frequency conversion unit 102 in prior art FIG. 5) for converting the modulation signals received by an antenna (e.g., antenna 101) into base band signals (e.g., see specification, page 2, lines 17-19), a channel estimation unit (e.g., detection unit 106) for detecting frequency characteristics of the radio channels on the basis of the modulated signals (e.g., see specification, page 2, line 19 to page 3, line 2), and a demodulation unit (e.g., 103-105 in conjunction with 107-109) for de-spreading and demodulating outputs (e.g., see specification page 2, line 23 to page 3, line 6). Further, as discussed above, H'mimy teaches an equalization filter unit (e.g., filter 95, see FIG. 1) of which frequency characteristics are inverse from that of the radio channels (e.g., see col. 4, lines 22-34), by using tap coefficients (e.g., select signals, see FIG. 2) from a channel estimation unit (e.g., ACC 80 in combination with 130 and 125). Additionally, as discussed above, the teachings of H'mimy provide improved channel estimation

by simplifying operation and resulting in instantaneous results (see col. 2, lines 5-49 and col. 4, lines 35-41). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to apply the CDMA teachings of H'mimy to the CDMA system of AAPA in order to provide improved channel estimation by simplifying operation and resulting in instantaneous results.

14. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of H'mimy, further in view of prior art recited in U.S. Patent No. 6,307,879 to Moriyama.

Regarding claims 2 and 4, AAPA in view of H'mimy teach the mobile station discussed above regarding claims 1 and 3, respectively, however may not specifically describe the filtering that is utilized. Moriyama also teaches a mobile station in a CDMA system (e.g., see col. 18, lines 56-59) and further, specifically describes a filter which is well known in the art of CDMA systems (e.g., prior art FIG. 5), wherein the filter comprises: a plurality of delay circuits which are connected in series (e.g., delay circuits 16a, see FIG. 5 and col. 3, line 44 – col. 4, line 61); a plurality of multipliers (e.g., multipliers 16b) each of which multiples a prescribed weight coefficient (e.g., weight factor, see col. 3, lines 53-63) by the output from each delay circuit (e.g., delay circuits 16a); and an adder (e.g., adder 16c) for adding the outputs from said multipliers (e.g., multipliers 16b), wherein modulated signals are equalized adaptively (e.g., filtering is adaptive, see col. 3, lines 44-52) as the distortions of the radio channels changes. Also, this well known filter (prior art FIG. 5) disclosed by Moriyama provides improved operation by minimizing error power (e.g., see col. 4, lines 62-63). Thus, at the time of the invention it would

have been obvious to one of ordinary skill in the art to apply the well known filter embodiment of FIG. 5 in Moriyama to the filter of AAPA in view of H'mimy since such a teaching is well known in the art of filtering in a CDMA system and in order to provide improved operation by minimizing error power.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 5,949,796 to Kumar, 6,356,607 to Scott et al., and 6,370,130 to Zhou et al., each disclose filtering techniques for a CDMA communication system.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M. Philpott whose telephone number is 571.272.3162. The examiner can normally be reached on M-F, 9:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. Vu can be reached on 571.272.3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Justin M Philpott

ALPUS H. HSU
PRIMARY EXAMINER